DOCUMENT RESUME

ED 232 481 FL 014 001

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TITLE	Microcomputers and Second Language Teaching. Q & A.
INSTITUTION	ERIC Clearinghouse on Languages and Linguistics, Washington, D.C.
SPONS AGENCY	National Inst. of Education (ED), Washington, DC.
PUB DATE	[83]
CONTRACT	400-82-0009
NOTE	6p.
PUB TYPE	Information Analyses - ERIC Information Analysis Products (071)
EDRS PRICE	MF01/PC01 Plus Postage.
DESCRIPTORS	Computer Assisted Instruction; Computer Managed Instruction; *Computer Programs; Elementary Secondary Education; Higher Education; *Microcomputers; *Second Language Instruction
IDENTIFIERS	Fact Sheets; PF Project

ABSTRACT

This fact sheet covers the possible uses of microcomputers in second language classrooms, addressing skills needed by instructors, types and uses of the available software, steps for program implementation and future applications. Published resources which can aid second language teachers in locating and evaluating applicable courseware, references and databases are listed. (JW)

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MICROCOMPUTERS AND SECOND LANGUAGE TEACHING. Q&A.

ERIC Clearinghouse on Languages and Linguistics

Prepared by John S. Harrison

FL014001

ERIC CLEARINGHOUSE ON LANGUAGES AND LINGUISTICS

Q&A

Microcomputers and Second Language Teaching

Prepared by John S. Harrison

What Do We Know about the Impact of Microcomputers on the Second Language Classroom?

Not much. Although large (so-called *mainframe)* computers have been used in the second language classroom for at least the past decade, and there is a body of research documenting their effectiveness, there are apparently no research reports on the use of *microcomputers* in second language instruction and few such reports on their use in other subject areas. However, much can be learned from research on large computers in the schools.

A study by the Educational Research Service (ERS) (1982) is instructive. ERS conducted a nationwide survey on how schools are using computers. Among other things, the 1,484 school districts which responded reported the following:

- Computers (in-house or through contracted services) are used by 91.5% of the respondents; 74.6% of the total respondents use them for both administrative and instructional purposes.

- Major benefits noted were "decrease in time spent on routine tasks" (66%); "information for planning and dissemination—available more quickly" (54.7%); and "new functions not previously possible within budget/personnel constraints now being performed" (54%).

- Major problems cited were "staff not adequately trained in using computers" (24.1%); "misunderstanding about the capabilities of computers" (20.5%); and "insufficient/inadequate software available" (20.2%).

- Factors judged most important to the successful and efficient introduction of computer technology into a school district were "technical training of staff" (43.5%); "availability of software packages" (37.9%); and "staff acceptance of computer technology" (29.3%).

Gerald Bracey's excellent article, "Computers in Education: What the Research Shows," gives specific insight into the effectiveness of instruction via computer. Dividing his observations into achievement outcomes, affective/motivational outcomes, and social outcomes, Bracy notes that "In general, students learn more, retain more, or learn the same amount faster using computers. Unfortunately, no studies have been completed yet that tell us *why* that may be. Achievement gains aside, students often find computers more 'human'—more patient, less critical—than humans." Bracey's remarks are based on two major studies: a meta-analysis of 51 research studies done by James Kulik and others at the University of Michigan (to be reported in detail in the *Journal of Educational Research* in early 1983) and a longitudinal study conducted by the Educational Testing Service in Los Angeles elementary schools over a period of four years.

With regard to studies specifically related to computer use in second language instruction, Holmes and Kidd (1982) give a succinct overview of this effort, and further details are available in Anastasia Wang's (1978) compendium. Olsen's (1980) extensive survey of colleges and universities is also a very useful resource. However, most of these reports, again, center on the use of mainframe computers.

Although research regarding microcomputers and second language instruction is yet to come, one can still develop an awareness of the microcomputer's inherent possibilities and limitations. Novices are well advised to consult such recently developed publications as *The Computing Teacher, Classroom Computer News,* and *Electronic Learning* for information of this kind.

What Skills Do I Need to Use a Microcomputer?

At this point, everyone needs to know how to turn on the computer, load software programs, and manipulate the programs. Until voice recognition by the computer reaches a more advanced stage of development, some degree of typing skill will continue to be important. Being an intelligent computer user would also include familiarity with relevant issues such as privacy, piracy, and information security.

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A question often posed by teachers is, "Do I need to know how to write programs?" Those who answer *yes* see as essential the ability to make the computer do what one wants it to do instead of being at the mercy of the person who has written the program. However, some special types of programs (usually referred to as "authoring systems") allow teachers to easily enter their own material into existing program frameworks. The proliferation of such authoring programs may eliminate the need for most teachers to learn programming.

One thing is clear: the need for teacher training in *using* computers is paramount. Those who want to learn about microcomputers will find a wide variety of inservice courses and training workshops, many tailored for the specific interests of second language teachers. Some language teachers will find that learning a programming language, with its built-in vocabulary and syntax, is analagous to learning another foreign language, although a much easier process. Many community colleges offer good introductory programming courses which will help a teacher decide whether or not to pursue further development of this skill.

What Kinds of Software Exist?

Educational software, often called *courseware,* ranges in scope and complexity from short, stand-alone programs teaching a single concept to sets of programs comprising a complete instructional sequence. Courseware can provide Computer Managed Instruction (CMI) or Computer Assisted Instruction (CAI). The term CMI describes administrative kinds of software such as programs that use the computer to store, analyze, and retrieve data on student achievement. In such programs, the student may take tests directly on the computer or on paper with the results being put into the student's computer record. CAI programs are, indeed, "instructional," and may involve one or more of these formats (Smith 1983):

- *Drill and Practice* presents problems or questions to reinforce specific skills or concepts on which the student has already received instruction. Among other things, these may be games in which students compete against the computer or each other.

- *Tutorial Dialogs* present instruction alternated with questions about the material presented, engaging the student in a kind of dialog to check comprehension.

- *Simulations* set up a model of a scientific or social event. The student interacts with this model by making decisions and subsequently learns the consequences of these decisions.

- *Problem-Solving* programs require calculation of complex formulas or arithmetic expressions. They allow the student to study mathematical topics which require rigorous calculations, to study history and sociology from a statistical perspective, and to perform analyses on data collected in the science laboratory.

Other types of software which may be used for instructional purposes include:

- Programs for word processing, business management, music composition, graphic design, or for connecting equipment such as microcomputers and videotape equipment.

- Database programs for the storage, manipulation, and retrieval of related information.

- "Utility" programs to allow teachers to keep gradebook records or generate printed worksheets and tests.

Of the approximately 100 microcomputer programs in foreign languages with which this author is familiar, about 90% fall into the drill-and-practice category. Since a large percentage of the work involved in learning a second language, especially at the lower levels, concentrates on rote work, this preponderance of drill materials is not necessarily a drawback. Many of the drill programs also incorporate some semblance of tutorial activities. Only a few of the commercially available programs—such as *Mystery House* (French version), published by Sierra On-Line Computing—could be called a simulation.

How Can I Get Under Way?

All practitioners agree that, in theory, the first three steps are to determine your objectives, choose the courseware, and select the microcomputer which will run that courseware. However, to set realistic objectives, the teacher must know what kind of courseware is available, what topics it deals with and at what level, what format it has, and whether it can be satisfactorily manipulated by the students. Once this information is obtained, the question becomes: Does this material help students attain goals that fit into the course?

Three published sources can assist the second language teacher in locating and evaluating courseware for foreign languages. Harrison's (1983) article in *Newsletter 13* of the Northeast Conference on the Teaching of Foreign Languages is the first such effort. Two others are available as a result of federal funding. In the summer of 1982, an institute sponsored by the National Endowment for the Humanities brought together approximately 30 foreign language teachers at the University of Delaware, who, among other activities, compiled *Foreign Language Teaching Programs for Microcomputers: A Volume of Reviews.* Under the aegis of the federal Office of Educational Research and Improvements, the University of Iowa has developed a similar volume entitled *Needs and Development Opportunities for Educational Computer Software for Foreign Language Instruction in Schools.*

To a great extent, the courseware chosen will dictate the brand of microcomputer to purchase, since the courseware for one brand of computer is, in general, not readily transferable to another. However, this situation is changing rapidly. In a report on the West Coast Computer Faire held in March 1983, Erik Sandberg-Diment (1983) reports the appearance of "a number of add-on circuit boards that can be slipped into an IBM PC to change its personality so it will think like an Apple, which means the IBM can suddenly run all of Apple's extensive software library."

Once objectives are set and courseware and microcomputer are acquired, the next consideration becomes how best to use the new technology. The state of Minnesota, a leader in the development of instructional computing, provides useful implementation and training checklists in its manual, *The Use of a Computer to Help Teach the School Curriculum*. Perhaps the trickiest problem to resolve is that most second language teachers are faced with one microcomputer for 30 or more students. Phillips (1983) suggests four possible approaches:

1. Total class instruction using one computer and a large monitor. This works especially well with simulations.

2. Timed-use relay. (The whole class is organized into a variety of small group activities, one of which is using the computer.)

3. Block-time format for independent work. (This is used primarily in self-contained classrooms. Each student is assigned a block of time weekly.)

4. Nonscheduled format.

As microcomputers receive wider acceptance and as budgets permit, one can expect the establishment of laboratory facilities equipped with a number of microcomputers. The technology for such installations already exists. Apple's Schoolbus system, for example, allows a teacher to use current Apple IIs, printers, and disks to form a network of disk-sharing computers. Thirty Apple computers can use programs stored at the instructor's station, eliminating the need for program disks and disk drives at each student station. With Radio Shack's Network 3 Controller, up to 16 Model III microcomputers can be connected to a single host system. Individual students can choose and work with any lesson stored in the host computer. As lessons that include student record-keeping are completed, performance information is automatically stored in the host computer for later review by the instructor.

What Else Can a Microcomputer Do for Me?

Up to now, discussion has centered on the microcomputer as an autonomous unit in the classroom. In fact, the microcomputer can also provide access to materials beyond the classroom, to whole libraries of information stored on mainframes or other microcomputers. These libraries, called databases, can be connected to the microcomputer via telephone. When looking for significant research or for an appropriate exercise for Monday morning classes, databases like that of the Educational Resources Information Center (ERIC) can be tapped from the comfort of the faculty lounge or one's own home. While ERIC is the largest education database, there are many others of interest to foreign and second language educators—Bilingual Education Bibliographic Abstracts, Psychological Abstracts, School Practices Information File, Resources in Computer Education, Resources in Vocational Education, and Exceptional Child Education Resources, to name a few. In fact, Markoff and Shea (1983) note that "Keeping track of all the on-line databases that have proliferated over the past decade requires a database itself." They also list the major database services such as BRS After Dark (significantly lower rates in the evening), the Source (which includes a bank of foreign language lessons), and CompuServe.

What More Is on the Horizon?

The microcomputer already permits significant instruction and practice in reading and writing skills and holds promise for being useful in learning speaking and listening skills. The cutting edge in technological development is in voice synthesis and voice recognition. There already exists a thumbnail-sized computer chip which can produce all the phonemes of human speech, permitting inexpensive text-to-speech synthesis. One can purchase a clock radio (Telestar) which announces the time in English, Spanish, Mandarin, Cantonese, or Taiwanese with excellent intelligibility. Second language teachers at the U.S. Air Force Academy are experimenting with interconnecting the microcomputer and videotape and videodisc equipment. Scott Instruments is already marketing its Voice-Based Learning System (VBLS) which, according to its publicity, "was designed for use by non-computer oriented persons, and requires no programming skills. Instructional lessons are vocally entered in the language to be used by the student. VBLS can understand any language, including utterances resulting from speech impediments. This makes it ideal for bilingual and second language study." Write a letter in one language on the computer and have it printed in another? One American company—Ditronics—is working on this problem. Speak to the computer in one language while a computer in a distant country translates? This is a current project of Japan's Fijitsu Company.

These are but a few of the many innovations in the computer industry which can be adapted to second language learning needs. These and other rapidly-occurring developments hold enormous promise for the near future.

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Database Services

BRS, 1200 Route 7, Latham, NY 12110; (800) 833-4707, (518) 783-1161.

CompuServe, 5000 Arlington Centre Blvd. P.O. Box 20212, Columbus, OH 43220; (614) 457-8600.

DIALOG Information Retrieval Service, 3460 Hillview Ave., Palo Alto, CA 94304; (800) 227-1960, in California (800) 982-5838.

This publication was prepared with funding from the National Institute of Education, U.S. Department of Education under contract no. 400-82-0009. The opinions expressed in this report do not necessarily reflect the positions or policies of NIE or ED.